

What Is Claimed Is:

1. A method for generating energy, comprising the steps of:  
providing a Bose-Einstein condensate of atoms;  
providing a beam for applying a compressive force; and  
5 using said beam to compress said Bose-Einstein condensate wherein a  
resulting reaction provides energy that can be used for propulsion or otherwise  
harnessed.

2. A method as set forth in Claim 1, wherein said step of providing a  
Bose-Einstein condensate comprises one of forming a Bose-Einstein condensate in a  
10 reaction chamber and forming a Bose-Einstein condensate in a preparation chamber  
and transporting said Bose-Einstein condensate into said reaction chamber.

3. A method as set forth in Claim 2, wherein said step of forming a  
Bose-Einstein condensate comprises providing a multiplicity of bosons.

4. A method as set forth in Claim 3, wherein said step of providing a  
15 multiplicity of bosons comprises providing  $^4\text{He}$ .

5. A method as set forth in Claim 2, wherein said step of forming a  
Bose-Einstein condensate comprises providing a multiplicity of Fermions.

6. A method as set forth in Claim 5, wherein said step of providing a  
20 multiplicity of Fermions comprises providing a multiplicity of Fermions arranged in a  
multiplicity of Cooper Pairs.

7. A method as set forth in Claim 1, wherein said step of using said  
beam comprises directing an electron beam at said Bose-Einstein condensate.

8. A method as set forth in Claim 1, wherein said step of using said  
beam comprises directing a particle beam at said Bose-Einstein condensate.

9. A method as set forth in Claim 1, wherein said step of using said  
25 beam comprises directing a beam of material at said Bose-Einstein condensate.

10. A method as set forth in Claim 1, wherein said step of using said  
beam comprises directing a radio frequency energy beam at said Bose-Einstein  
condensate.

11. A method as set forth in Claim 1, wherein said step of using said  
30 beam comprises directing a high energy laser beam at said Bose-Einstein condensate.

12. A method as set forth in Claim 11, wherein said step of using said high energy laser beam comprises directing a femto-second laser beam at said Bose-Einstein condensate.

5 13. A method as set forth in Claim 1, wherein said step of using said beam comprises directing an x-ray beam at said Bose-Einstein condensate.

14. A method as set forth in Claim 1, wherein said step of using said beam comprises directing light at said Bose-Einstein condensate.

10 15. A method as set forth in Claim 1, wherein said step of using said beam comprises directing said beam at said Bose-Einstein condensate from at least two different directions.

16. A method as set forth in Claim 15, wherein said beam comprises a laser beam.

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17. An apparatus for compressing a Bose-Einstein condensate comprising:

means for introducing a Bose-Einstein condensate of atoms into a reaction chamber;

5 means for compressing said Bose-Einstein condensate in said reaction chamber; and

means for harnessing a reaction product of said compression of said Bose-Einstein condensate.

18. An apparatus as set forth in Claim 17, wherein said means for  
10 introducing comprises forming a Bose-Einstein condensate.

19. An apparatus as set forth in Claim 18, wherein said Bose-Einstein condensate comprises a multiplicity of bosons.

20. An apparatus as set forth in Claim 19, wherein said multiplicity of bosons comprises  $^4\text{He}$ .

21. An apparatus as set forth in Claim 18, wherein said Bose-Einstein condensate comprises a multiplicity of Fermions.

22. An apparatus as set forth in Claim 21, wherein said multiplicity of Fermions comprises Fermions arranged in Cooper Pairs.

23. An apparatus as set forth in Claim 17, wherein said means for  
20 introducing comprises providing a receptacle to contain said Bose-Einstein condensate.

24. An apparatus as set forth in Claim 17, wherein said means for compressing comprises:

25 a beam source for generating a beam for applying a compressive force; and means for using said beam to compress said Bose-Einstein condensate.

25. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting an electron beam.

26. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting a particle beam.

27. An apparatus as set forth in Claim 24, wherein said beam source  
30 comprises means for transmitting a beam of material.

28. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting a radio frequency energy beam.

29. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting a high energy laser beam.

30. An apparatus as set forth in Claim 29, wherein said means for transmitting a high energy laser beam comprises means for transmitting a femto-second laser beam.

31. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting an x-ray beam.

32. An apparatus as set forth in Claim 24, wherein said beam source comprises means for transmitting light.

33. An apparatus as set forth in Claim 24, wherein said means for using comprises means for directing said beam at said Bose-Einstein condensate from at least two different directions.

34. An apparatus as set forth in Claim 33, wherein said beam source comprises a laser beam.

35. An apparatus as set forth in Claim 24, wherein said means for using comprises a focusing means for focusing said beam on said Bose-Einstein condensate.

36. An apparatus as set forth in Claim 35, wherein said focusing means comprises at least one lens.

37. An apparatus as set forth in Claim 35, wherein said focusing means comprises at least one mirror.

38. An apparatus as set forth in Claim 35, wherein said focusing means comprises an electromagnetic focusing means.

39. An apparatus as set forth in Claim 17, further comprising a window into said reaction chamber formed from one of sapphire or diamond.

40. An apparatus as set forth in Claim 17, wherein said means for harnessing comprises:

means for shielding an area adjacent to said reaction chamber from said

reaction product of said compression;

means for converting said reaction product of said compression to energy.

41. An apparatus as set forth in Claim 40, wherein said means for shielding comprises a radiation shield.

42. An apparatus as set forth in Claim 40, wherein said means for converting comprises:

5 means for receiving heat based on said reaction product of said compression;  
and  
means for transforming said heat to said energy. *product → H<sub>2</sub>O → energy*

43. An apparatus as set forth in Claim 42, wherein said means for receiving heat comprises a heat exchanger including a fluid for receiving heat from said reaction product.

44. An apparatus as set forth in Claim 40, wherein said means for converting comprises:

means for using said reaction product of said compression as a propellant.

45. An apparatus as set forth in Claim 40, wherein said means for converting comprises:

means for using said reaction product of said compression to heat a substance;  
means for transforming said heat in said substance to said energy. *product → secondary circuit → H<sub>2</sub>O → energy*

46. An apparatus as set forth in Claim 45, wherein said means for transforming comprises a heat exchanger for transferring heat to a drive medium for driving a power generator.

47. An apparatus as set forth in Claim 40, wherein said means for converting comprises:

means for injecting a substance into said reaction product of said compression to form a mixture; and

means for using said mixture to generate power.

48. A method for use in producing useable energy, comprising the steps of:

providing a condensate of atoms wherein at least some of the atoms have overlapping wave functions ("co-located atoms");

5 exposing the condensate of atoms to a source of energy such that at least some of the co-located atoms fuse thereby releasing fusion energy; and

harnessing a portion of the fusion energy released by the fused co-located atoms.

49. A method as set forth in Claim 48, wherein said step of providing  
10 comprises providing a Bose-Einstein condensate.

50. A method as set forth in Claim 49, wherein said Bose-Einstein condensate comprises one of bosons and paired Fermions.

51. A method as set forth in Claim 48, wherein said step of exposing  
comprises exposing the co-located atoms to energy sufficient to achieve fusion.

15 52. A method as set forth in Claim 48, wherein said step of exposing comprises exposing the co-located atoms to energy sufficient to de-condense at least some of said co-located atoms so as to achieve fusion.

53. A method as set forth in Claim 48, wherein said co-located atoms  
20 are fused in a reaction chamber (54) and said step of harnessing comprises using an energy flux from said reaction chamber.

54. A method as set forth in Claim 53, wherein said step of using said energy flux comprises receiving heat from said reaction chamber.

55. A method as set forth in Claim 53, wherein said step of using said energy flux comprises using a reaction product stream expelled from said reaction  
25 chamber.

56. A method as set forth in Claim 55, wherein said reaction product stream is used for propulsion.

57. A method as set forth in Claim 55, wherein an energy of said reaction product stream is used to run a power generator.

58. A method as set forth in Claim 55, wherein said step of using a  
30 reaction product stream comprises contacting said reaction product with a

supplemental material such that said stream includes said reaction product and said supplemental material.

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